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January 29, 2003

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APPLICATION NUMBER: *60/346,883*
FILING DATE: *January 11, 2002*

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

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PTO/SB/16 (02-01)
Approved for use through10/31/2002. OMB 0651-0032
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Matthew James	Longman	Kelowna, Canada

☐ *Additional inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

Bathtub Having Sliding Access Door For The Disabled And Elderly

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 9 ☐ CD(s), Number

☒ Drawing(s) *Number of Sheets* 16 ☐ Other (specify) Power of Attorney, return receipt postcard

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

☐ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:

☒ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($) $80.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE _____

TYPED or PRINTED NAME Antony C. Edwards

TELEPHONE (250) 861-4022

Date 01 / 10 / 02

REGISTRATION NO. *(if appropriate)* 40,288

Docket Number: TE/10848

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

PTO/SB/17 (10-01)
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FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 80.00

Complete if Known	
Application Number	
Filing Date	
First Named Inventor	Matthew James Longman
Examiner Name	
Group Art Unit	
Attorney Docket No.	TE/10848

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   - Deposit Account Number: 02-2452
   - Deposit Account Name: Bishop & Company
   - ☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
   - ☒ Applicant claims small entity status. See 37 CFR 1.27
2. ☒ **Payment Enclosed:** ☐ Check ☒ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	80.00

SUBTOTAL (1) ($) 80.00

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =		X	= 0
Independent Claims		- 3** =		X	= 0
Multiple Dependent					= 0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for *ex parte* reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,280	241	640	Petition to revive - unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17(q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($) 0

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	Antony C. Edwards	Registration No. (Attorney/Agent)	40,288	Telephone	(250) 861-4022
Signature				Date	January 10, 2002

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BATHTUB HAVING SLIDING ACCESS DOOR FOR THE DISABLED AND ELDERLY

Field of the Invention

This invention relates to the field of bathtubs and in particular a bathtub having a door providing improved access for the disabled and elderly.

Background of the Invention

It is well known that people with limited mobility such as disabled and elderly often require assistance to use a conventional bathtub in order to properly bathe because their limited mobility inhibits them from safely lowering themselves or lifting themselves out of a conventional bathtub.

To address such a need, applicant is aware of attempts in the prior art to provide bath enclosures with access doors. For example, applicant is aware of United States Patent Number 3,423,769 which issued Cowley for a bath on January 28, 1969, wherein Cowley discloses the use of a guillotine style door to provide access for infirm persons to a bathtub.

Applicant is also aware of United Kingdom Patent Specification Number 1,213,358 published November 25, 1970 for The Improvements In Or Relating To Baths of Preston which discloses use of a sliding door to close an aperture in a bath, where the door slides horizontally on a guide upon the operation of double-acting hydraulic cylinder and piston.

Applicant is also aware of European Patent Application Number 0 913 115 which was published May 6, 1999 for The Bath With A Side Access Opening Equipped With A Watertight Flap of Landi et al. which discloses a bath equipped with either a door hinged horizontally or vertically or a horizontally or vertically sliding door.

Applicant is also aware of United Kingdom Patent Application No. 2 334 438 published August 25, 1999 for The Circular Sliding Door For A Bathtub of Nailer which discloses the use of a bathtub having a circular sliding door. The door slides sideways in both directions and moves forward and backward on rollers mounted to top and bottom of the door. The rollers run on runners which are fixed to panels above and below the rollers, the roller wheels interlocking with the runners. Hydraulic actuators hold the door when closed against a door seal.

Brief Description of the Drawings

Figure 1 is, in a front, right side perspective view, a bathtub incorporating the access door of the present invention.

Figure 2 is the view of Figure 1 with the access door cover removed and the bathtub shown in dotted outline.

Figure 3 is, in enlarged rear, left side perspective view, the access door of Figure 2.

Figure 4 is, in partially cut away enlarged view, the access door of Figure 2.

Figure 5 is, in further enlarged and partially cut away view, the access door and locking mechanism of Figure 4.

Figure 5a is the door of Figure 5 in the open position.

Figure 6 is, in front elevation view, an alternative embodiment of the access door of the present invention.

Figure 6a is a sectional view, partially cut away, through a sidewall of the bathtub showing the mating of a pivot arm with a channel insert in the bathtub wall.

Figure 6b is, in plan view, one of the pivot arms and roller wheels of Figure 6.

Figure 7 is, in partially cut away bottom view, the access door of Figure 6 mounted to a door guide channel formed below the bathtub.

Figure 8 is, in bottom view, the door and door guide of Figure 7.

Figure 9 is, in plan view, a third embodiment of the bathtub having a sliding access door of the present invention showing the door closed.

Figure 10 is, in side elevation view, the bathtub and sliding access door of Figure 9.

Figure 11 is, in plan view, the bathtub and sliding access door of Figure 9 showing the door in its opened position.

Figure 12 is, in side elevation view, the bathtub and sliding access door of Figure 11.

Figures 13 are, in sectional view along line 13-13 and side elevation view, the sliding door guide of the access door of Figure 10.

Figures 14 are, in side elevation view and plan view, the upper door pivot arm of the sliding access door of Figure 9.

Figures 15 are, in plan view and side elevation view, the lower door pivot arms of the access door of Figure 9.

Figure 16 is an enlarged partially sectioned view of the roller mounting of the end of the lower door pivot arm within the channel insert within the tub side wall of Figure 10.

Figure 17 is, in enlarged partially cut away, and in section view, the hand rail of Figure 12.

Figure 18 is, in partially cut away front elevation view, the door of Figure 12.

Detailed Description of Embodiments of the Invention

As seen in Figure 1, bathtub 10 is elevated on a frame or pedestal 12 so that a door 14 mounted to one side of the bathtub is elevated. For example, bathtub 10 may be elevated so that the side door opening occupied by door 14 when in its closed position is level with a typical chair seat elevation. For example, the floor of bathtub 10 may be elevated to correspond to a typical wheelchair height of 17.5 inches, although this is not intended to be limiting. Pedestal 12 may be used for storage and provides for ease of access for maintenance, etc. The bathtub and pedestal may be sized to replace an existing conventional bathtub.

As better seen in Figures 2-5, wherein the cover 16 of door 14 is either removed or shown in dotted outline, the cover 16 encloses a lock actuating mechanism 20. In particular, lock actuating mechanism 20 includes an operating lever 22 having a handle 24 at an upper end thereof. Lever 22 is pivotally mounted, for example by means of shaft 26, to mounting or backing plate 28 rigidly mounted to an interior surface of door cover 16.

Crank arm 30 is also mounted on shaft 26 and is rigidly mounted to lever 22, for example by means of collar 32, so that rotation of lever 22 in direction A about shaft 26 simultaneously correspondingly rotates crank arm 30 to thereby translate cross arm 34 in direction B. Rotation of lever 22 about shaft 26 unlatches four spring-loaded door latches. In particular, translation of cross arm 34 in direction B rotates upper bell crank members 36 about

axes of rotation C to thereby actuate, that is, retract upper spring-loaded door latch members 38 from conventional door latch mechanisms 40. Such rotation of upper bell crank members 36 simultaneously drives a pair of corresponding connecting rods 42 in direction D so as to simultaneously rotate lower bell crank members 44 about axes of rotation E. Rotation of lower bell crank members 44 retracts lower spring-loaded door latch members 46 from door latch mechanisms 48.

Door latch members 38 and 46 are thus simultaneously retracted by operation of lever 22 so as to retract the door latch members inwardly of the door in direction F, thereby retracting the door latch members from engagement in correspondingly sized apertures in plates 50 mounted to the opposed facing surfaces of the door opening in bathtub sidewall 10a. The spring-loaded door latch members automatically engage the apertures in plates 50 under the resilient urging of their spring mechanisms so as to lock door 16 in watertight sealed engagement within the door opening of sidewall 10a.

A water reservoir 52 is mounted with sidewall 10a. Reservoir 52 is in fluid communication with the inside of bathtub 10 so that as bathtub 10 is filled with water, so too water fills reservoir 52 to a corresponding level until reservoir 52 is full. Reservoir 52 is shown partially cut away so that internal float 54 may be seen. As the water lever rises within reservoir 52 corresponding to the level of water with bathtub 10, float 54 rises with the water level in the reservoir so as to drive upwardly in direction G end 56a of bell crank 56. Bell crank 56 is rotatably mounted to a supporting member 58 for pivoting rotation in direction H so that actuation of end 56a in direction G by the urging of a rising float 54 in reservoir 52 rotates the bell crank. Rotation of the bell crank drives a pin 60 in direction I through a corresponding aperture in plate 50 and into mating engagement with an apertured or channelled plate 62 rigidly mounted to one of the connecting rods 42. With pin 60 so mated the reverse actuation of lock actuating mechanism 20 is prevented. Thus, when water is in the bathtub, the mating of pin 60 in plate 62 prevents the unlocking of door 14 which might otherwise be inadvertently unlocked by a user operating lever 22 resulting in flooding of the bathroom.

When water is not present in bathtub 10, so that the lowering of float 54 in reservoir 52 has resulted in the retraction of pin 60 from locking engagement within plate 62, a user may then grasp handle 24 and operate lever 22 so as to retract latch members 38 and 46 from their locking engagement in plates 50. This then unlocks door 14 from its locked engagement within the door opening of sidewall 10a allowing the door to be opened.

Door 14 is opened once the door latches are released by a user pushing the door outwardly of the bathtub from the door's co-planar relation with sidewall 10a. A user pushing door 14 outwardly in direction J unseats the door from the door's watertight seals 64 mounted circumferentially around the inner surface of the door opening circumferential lip 66.

Such outward translation of door 14 in direction J also correspondingly outwardly translates door supporting plate 68. A pair of pivot arms 70 are pivotally mounted at first ends of the pivot arms to door supporting plate 68 and at opposite second ends of the pivot arms to sliding sleeves or collars 72. Sliding collars 72 are free to slide in direction K along a linear rail or rod 74 mounted recessed into channel 76 in sidewall 10a. Similarly, pivot arm 78 is pivotally mounted at its first end to frame 18, or otherwise to door 14, and at its opposite second end to sleeve or collar slide 80. Collar slide 80 is slidably mounted on a rail or rod 82. Rod 82 is mounted parallel to, and vertically spaced from, rod 74 within channel 84 of sidewalls 10a. Thus, translation of door 14 in direction J upon opening of the door rotates pivot arms 70 in direction L and pivot arm 78 in direction M thereby swinging door 14 outwardly of rods 74 and 82 while maintaining door 14 parallel to the plane containing rods 74 and 82. Once door 14 is swung clear of the door opening in sidewall 10a, the door may be translated by sliding the door in direction N along the length of rods 74 and 82 to thereby completely open the door opening for access by a user.

Door 14 is closed and locked by reversing the opening procedure, with the exception that lever 22 does not have to be operated to re-latch the door latching members in

the apertures in plates 50, as the spring-loading of the members automatically seats the members in the apertures.

In an alternative embodiment such as seen in Figures 6-8, door 14 is mounted on a pair parallel vertically spaced apart pivot arms 86 at a first end of the door, and on a door guide 88 mounted towards the opposite second end of the door so as to depend downwardly from door 14. In this embodiment, channels 76 and 84 in sidewall 10a are shaped to receive therein, along the length of the channels, the distal ends of pivot arms 86 and their corresponding rotatably mounted roller wheels 90. As better seen in Figure 6a, the channels may be formed by the use of channel inserts 92 mounted into sidewall 10a. Pivot arms 86 are pivotally mounted to door 14 so that, once locking mechanism 20 is disengaged, as before, door 14 may be translated outwardly of the tub in direction J so as to clear the first end of the door from the door opening in sidewall 10a so as to allow translation of the door along the channels in direction N.

Door guide 88 extends rigidly cantilevered outwardly from the bottom of door 14. Similar to pivot arms 86, it too has a roller wheel 90' rotatably mounted at its distal end. Roller wheel 90' mates in door guide track or channel 94 formed in a support (not shown) mounted below the lower surface of bathtub 10. Channel 94 has an arcuate or curved end 94a at an end of channel 94 opposite to channels 76 and 84. Thus as door 14 is being closed by being translated in a direction opposite to direction N, roller wheel 90' on door guide 88 follows the curved end 94a of channel 94 to draw door 14 into the door opening in sidewall 10a in a direction opposite to direction J. The pivoting of pivot arms 86 relative to channels 76 and 84 and relative to door 14 allow the door to be drawn into the door opening in sidewall 10a by the operation of roller wheels 90' following curved end 94a of channel 94. Roller wheel 90' reaching the end, or near to the end of curved end 94a of channel 94 coincides with door 14 seating into the door opening of sidewall 10a so that locking mechanism 20 may be actuated to lock the door in its closed position.

In a third embodiment of the present invention, as seen in Figures 9 and 10 which show a bathtub with door 100 closed, and as seen in Figures 11 and 12 which show the bathtub with door 100 in the open position, the door may pivot on upper and lower door pivot arms 102 and 104 respectively. Door 100 opens to inside of bathtub 106 so as to slidably translate between the closed position of Figures 9 and 10 wherein the outwardly flared circumferential lip 108 of door 100 seats against door opening perimeter lip 110 so as to make a watertight seal, and the open position of Figures 11 and 12 wherein door 100 has been slid into the interior of bathtub 106 into a position parallel with side wall 106a.

As may be seen in Figure 10 by the partial cutting away of side wall 106a one end of lower door pivot arm 104 is rotatably mounted to a first end of door 100, and the other end of the lower door pivot arm is slidably mounted within a stainless steel channel 112 mounted into the inner wall of side wall 106a. Upper door pivot arm 102 is mounted generally parallel to lower door pivot arm 104, with one end of the upper door pivot arm 102 rotatably mounted to the first end of door 100, and the opposite end of upper door pivot arm 102 rotatably mounted to a sliding collar such as sliding door guide 114. Guide 114 is slidably mounted onto hand rail 116, hand rail 116 being rigidly mounted to the upper edge of side wall 106a. Thus, as door 100 slidably translates between its open and closed positions, the door is free to travel horizontally along an arcuate trajectory such as arcuate trajectory 118 by the pivoting action of the door pivot arms which support the door in relation to the side wall of the tub.

As seen in Figure 18, when in its closed position, door 100 may be releasably locked or latched into place by the operation of latch pins 120 translating horizontally outwardly in directions G so as to journal the distal ends of the latch pins in correspondingly sized holes in the opposed facing sides of lip 110. Latch pins 120 are translated outwardly in directions G and are retracted in opposite directions by the rotation of lever 122 in direction H. Thus, with door 100 seated against lip 110, lever 122 may be rotated in direction H so as to lock door 100 within the side wall of the tub by the actuation of latch pins 120 in directions G. By operation of lever 122 in a reversed direction, the ends of latch pins 120 may be retracted,

freeing door 100 for opening. Of course, in a further alternative embodiment, door 100, with its corresponding pivot arms, sliding door guide, and latch pin arrangement, could be made to slide to the outside of side wall 106a.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof.

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Application Number	
Filing Date	
First Named Inventor	Matthew James Longman
Title	Bathtub Having Sliding Access Door For The Disabled And Elderly
Group Art Unit	
Examiner Name	
Attorney Docket Number	TE/10848

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I am the:

[X] Applicant/Inventor.

[ ] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	Matthew James Longman
Signature	
Date	January 8, 2002

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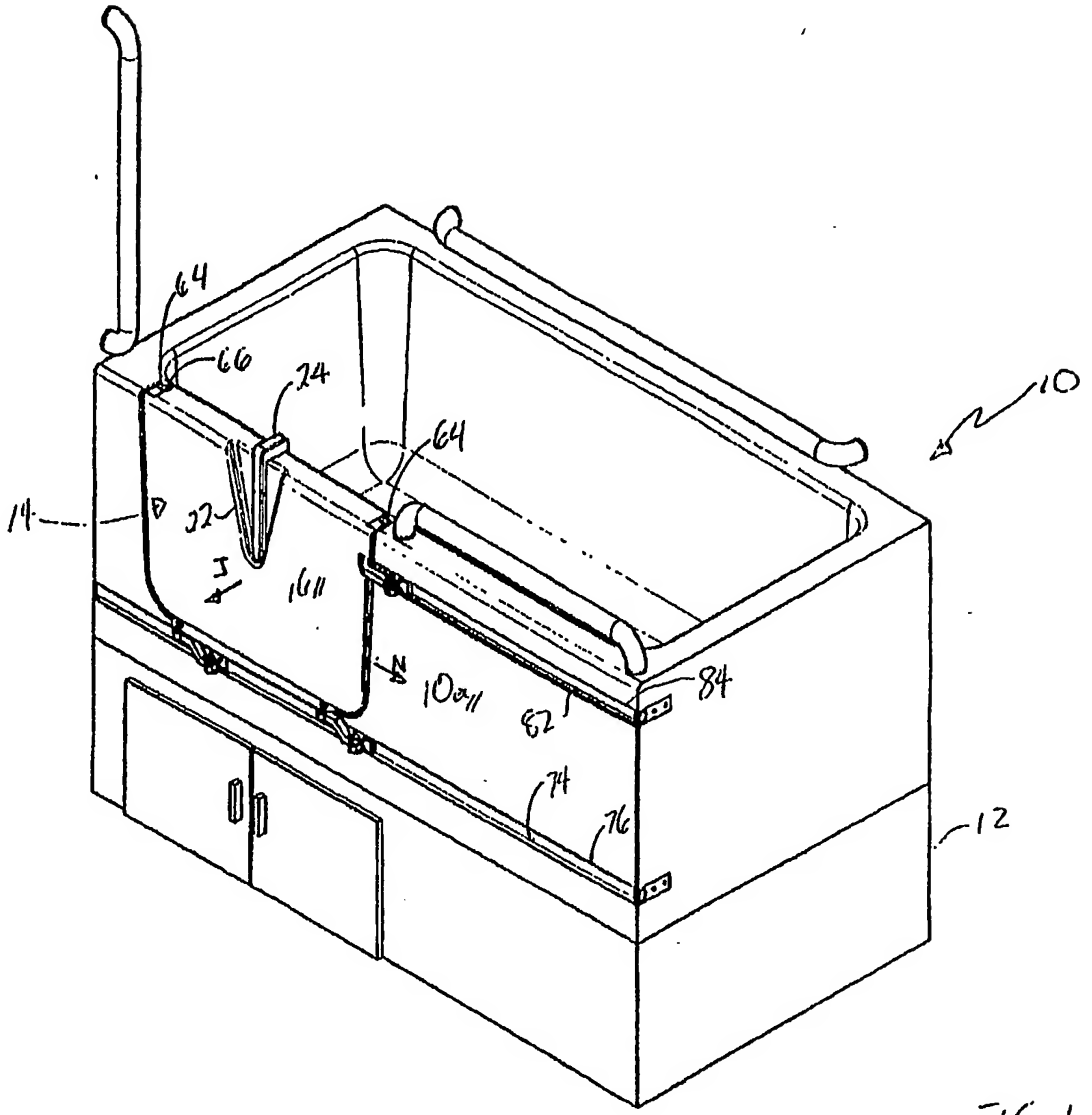


FIG. 1

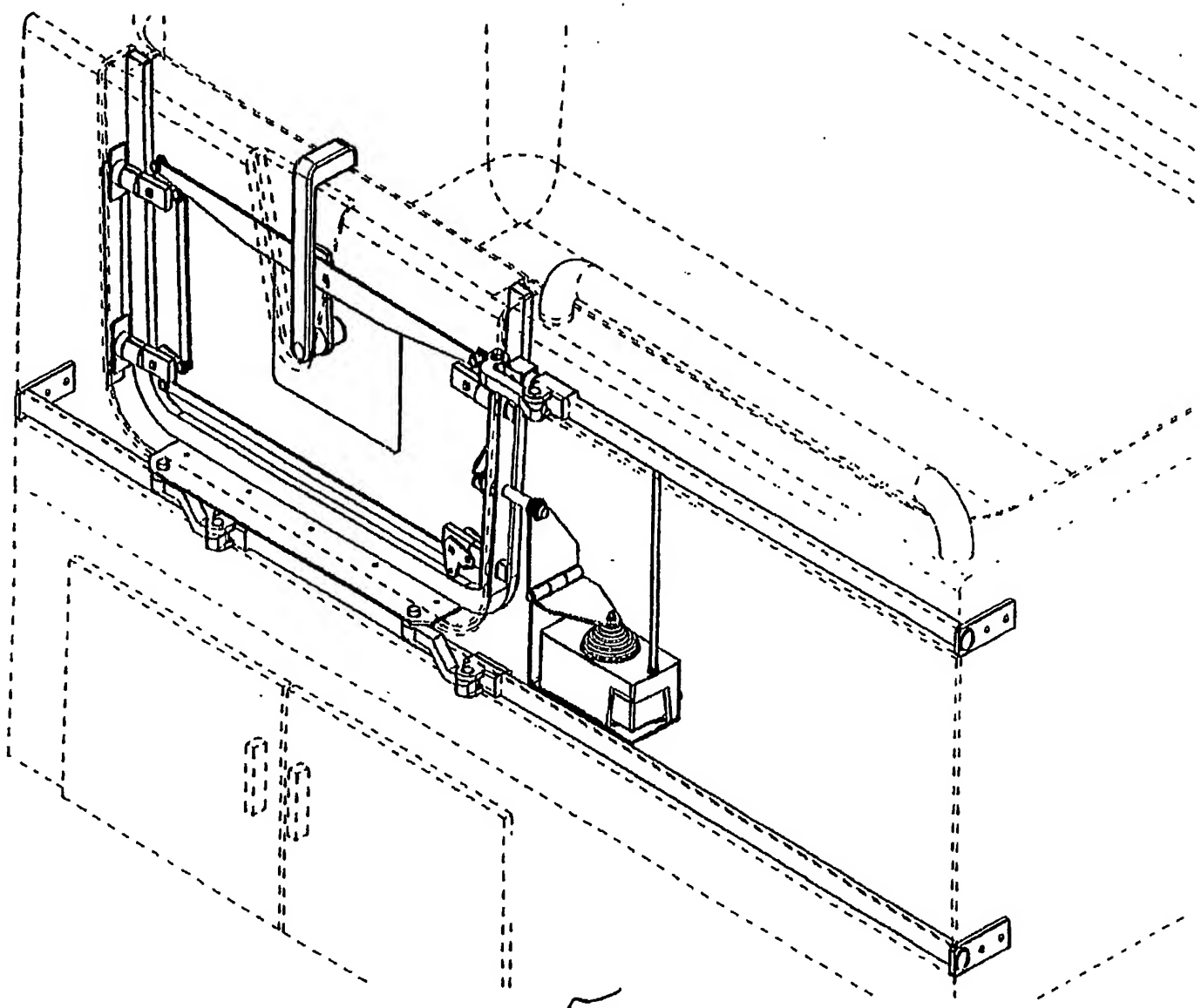


FIG. 2

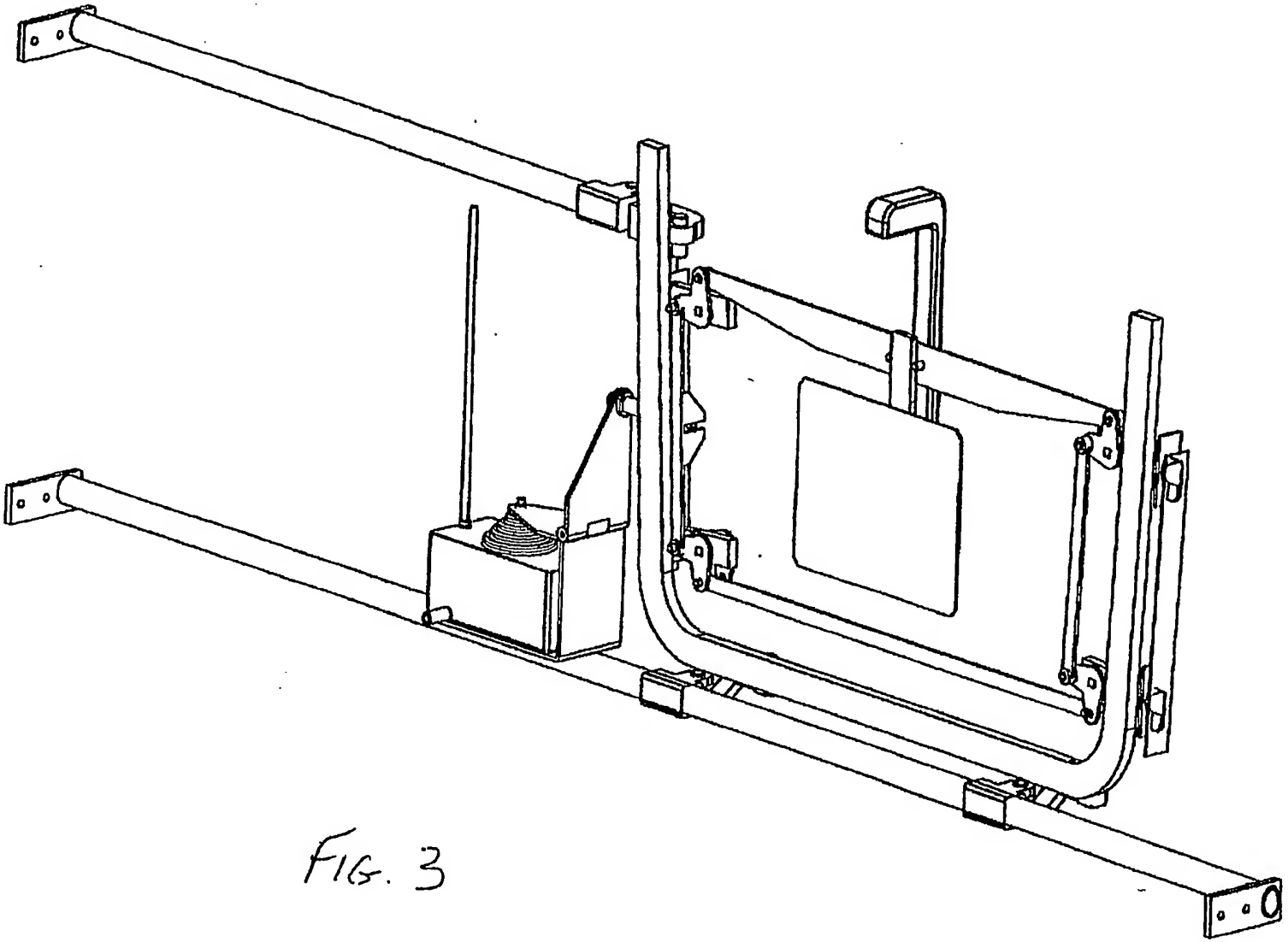


FIG. 3

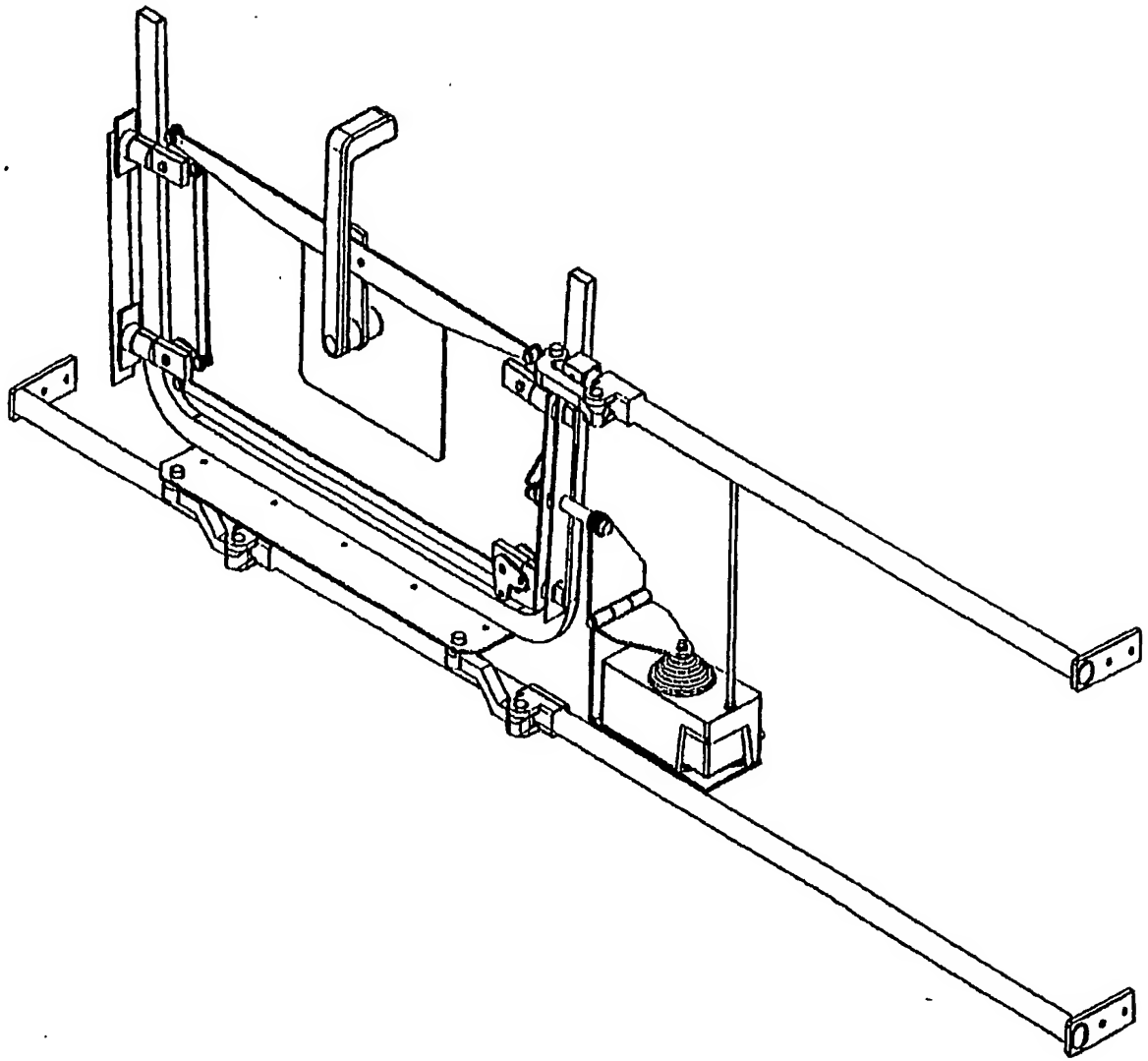


FIG 4

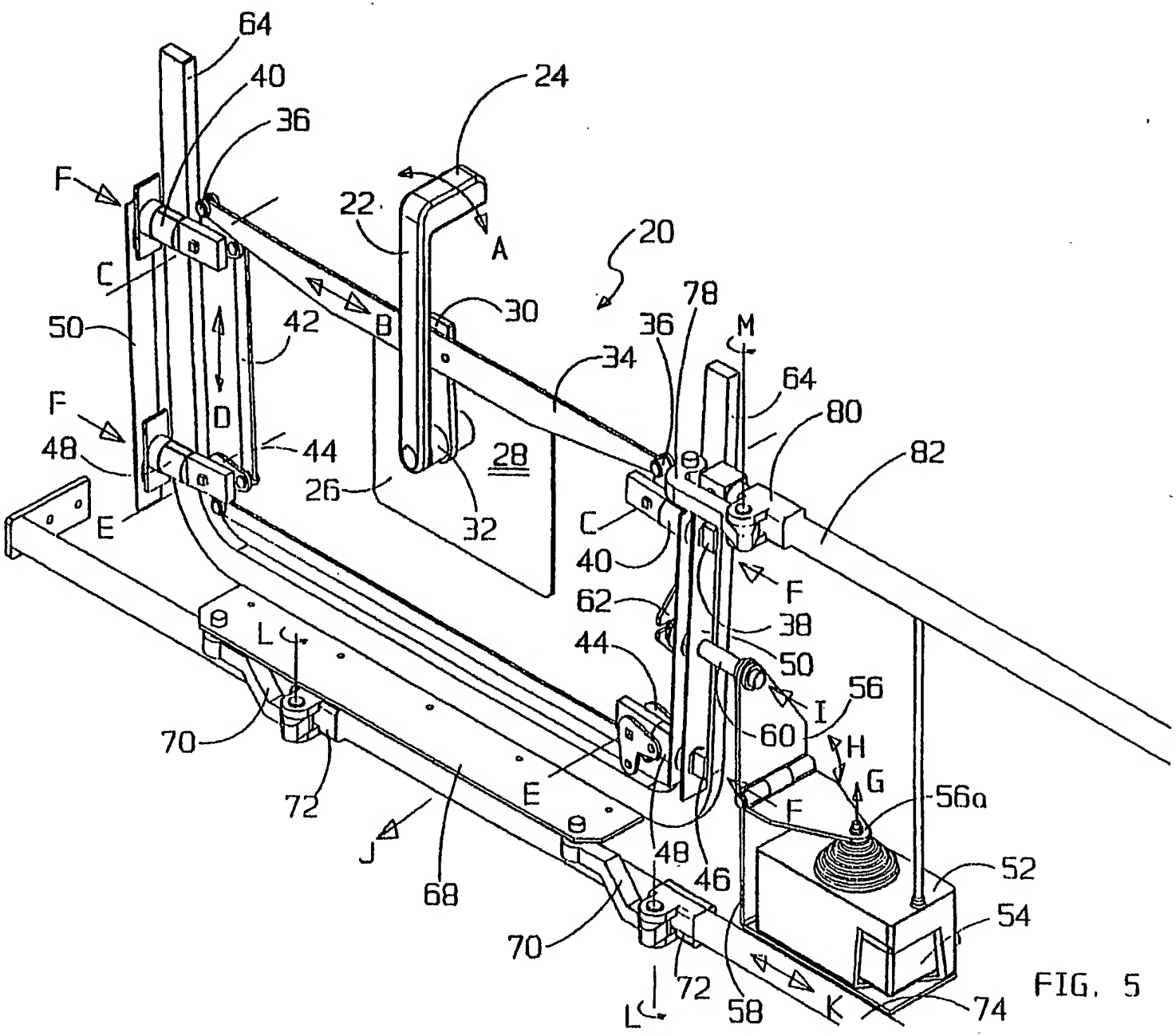


FIG. 5

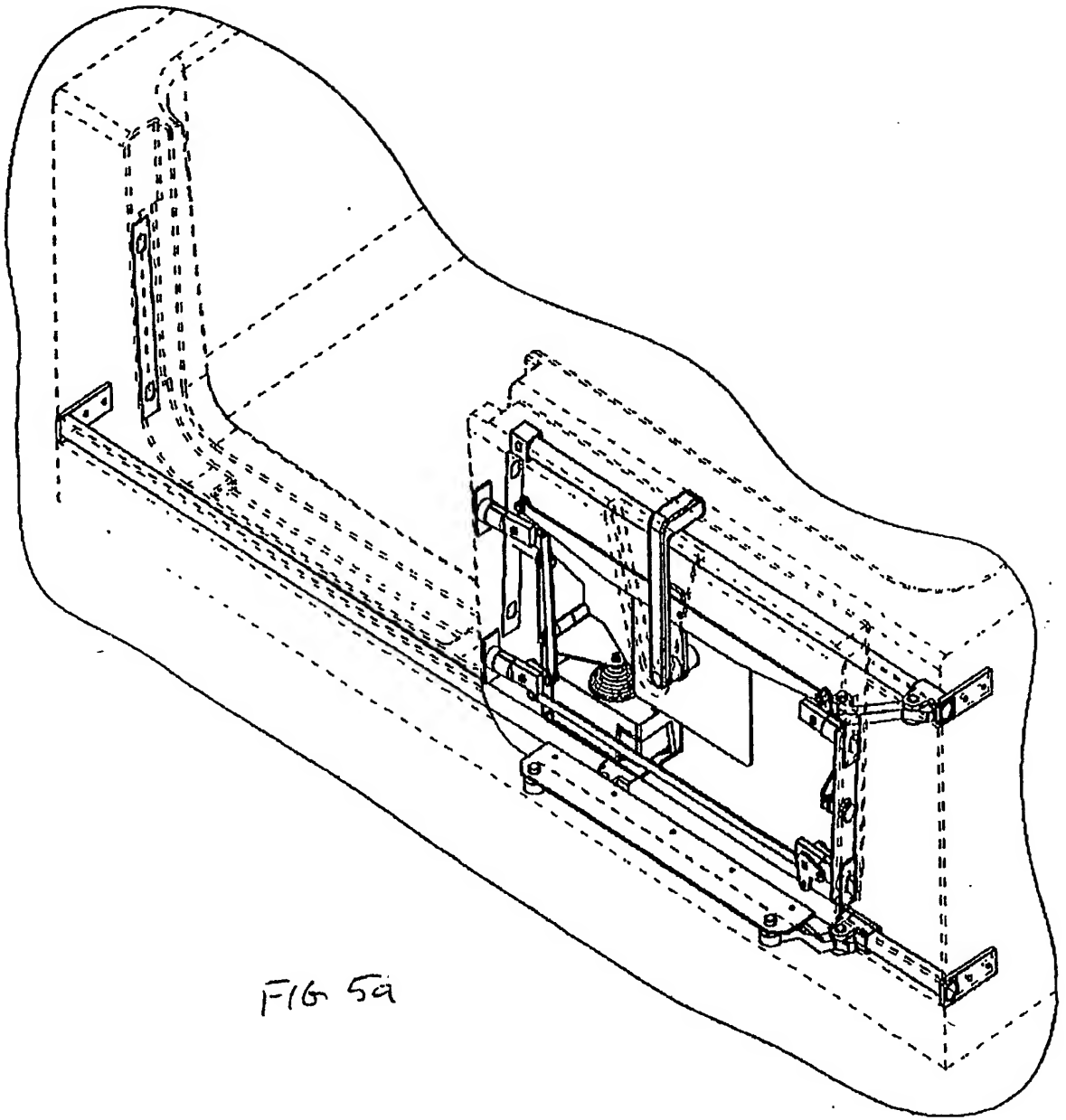
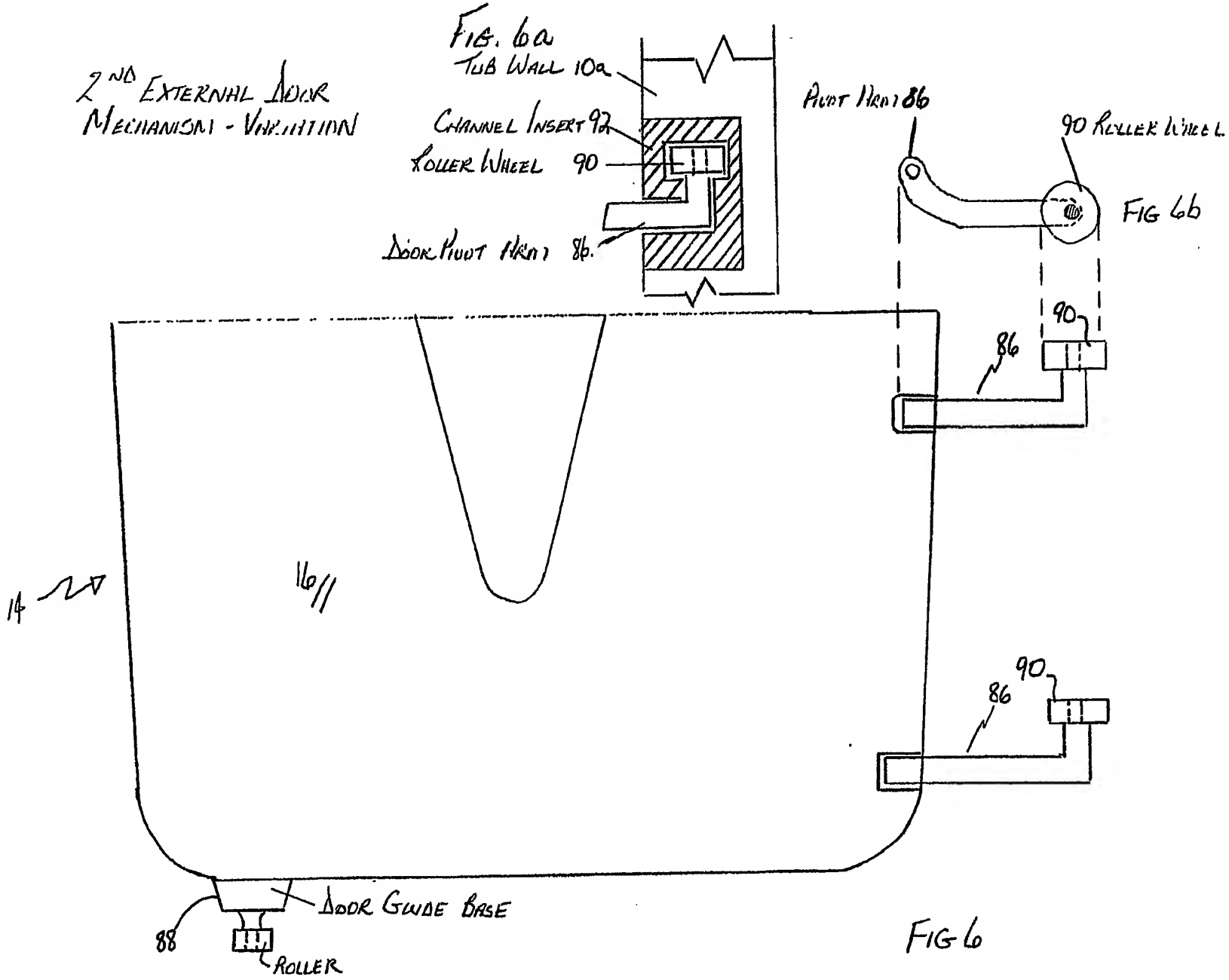
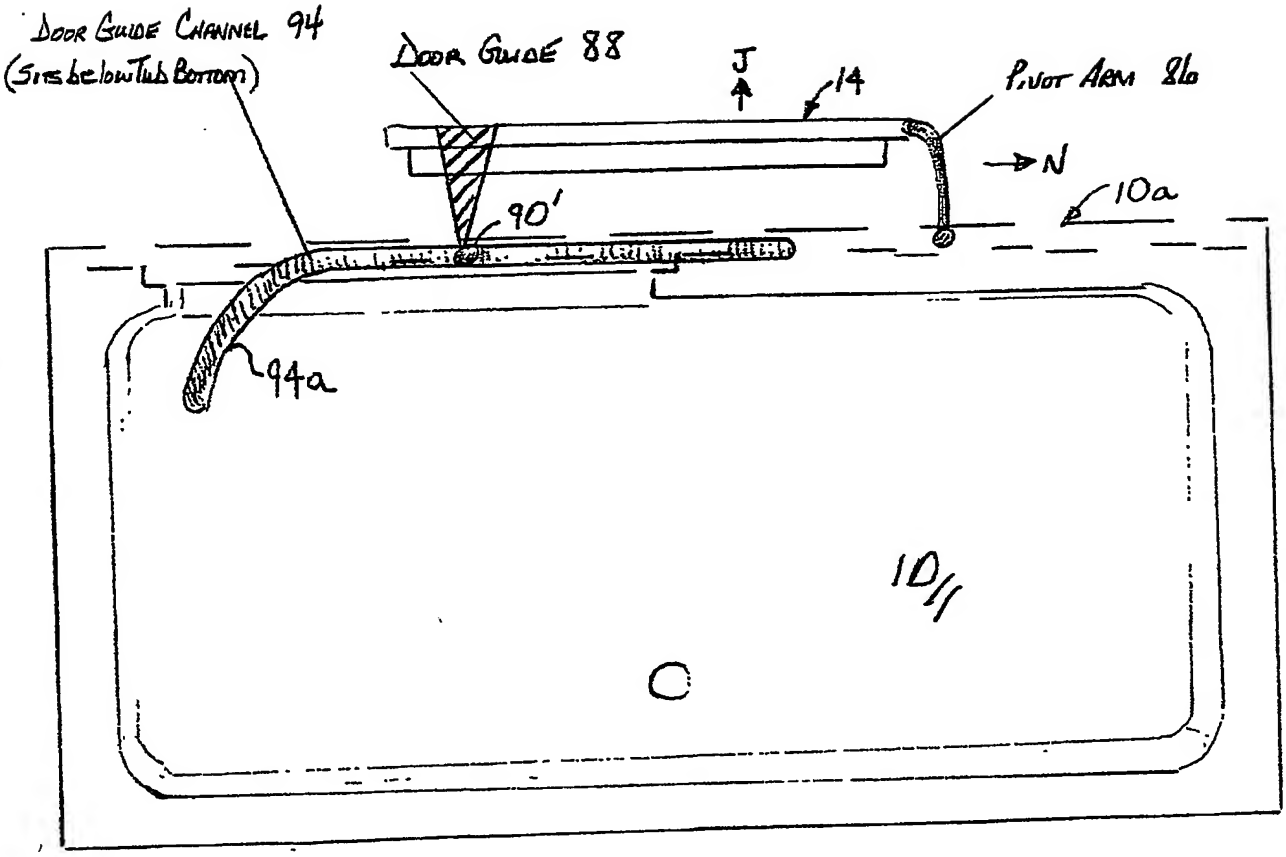


FIG 5a



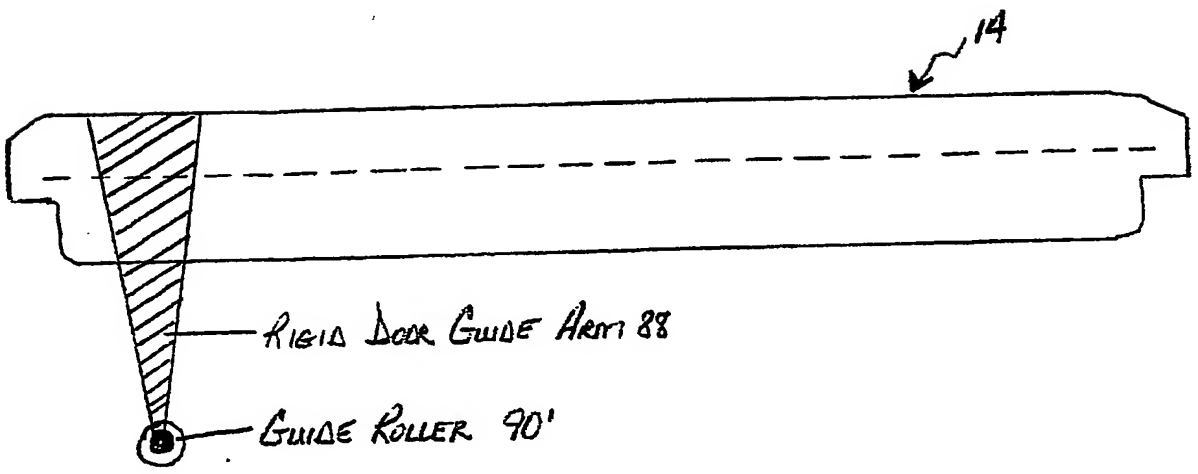
BOTTOM VIEW OF TUB



2ND EXTERNAL DOOR MECHANISM

FIG 7

BOTTOM OF DOOR



2ND EXTERNAL DOOR MECHANISM

FIG 8

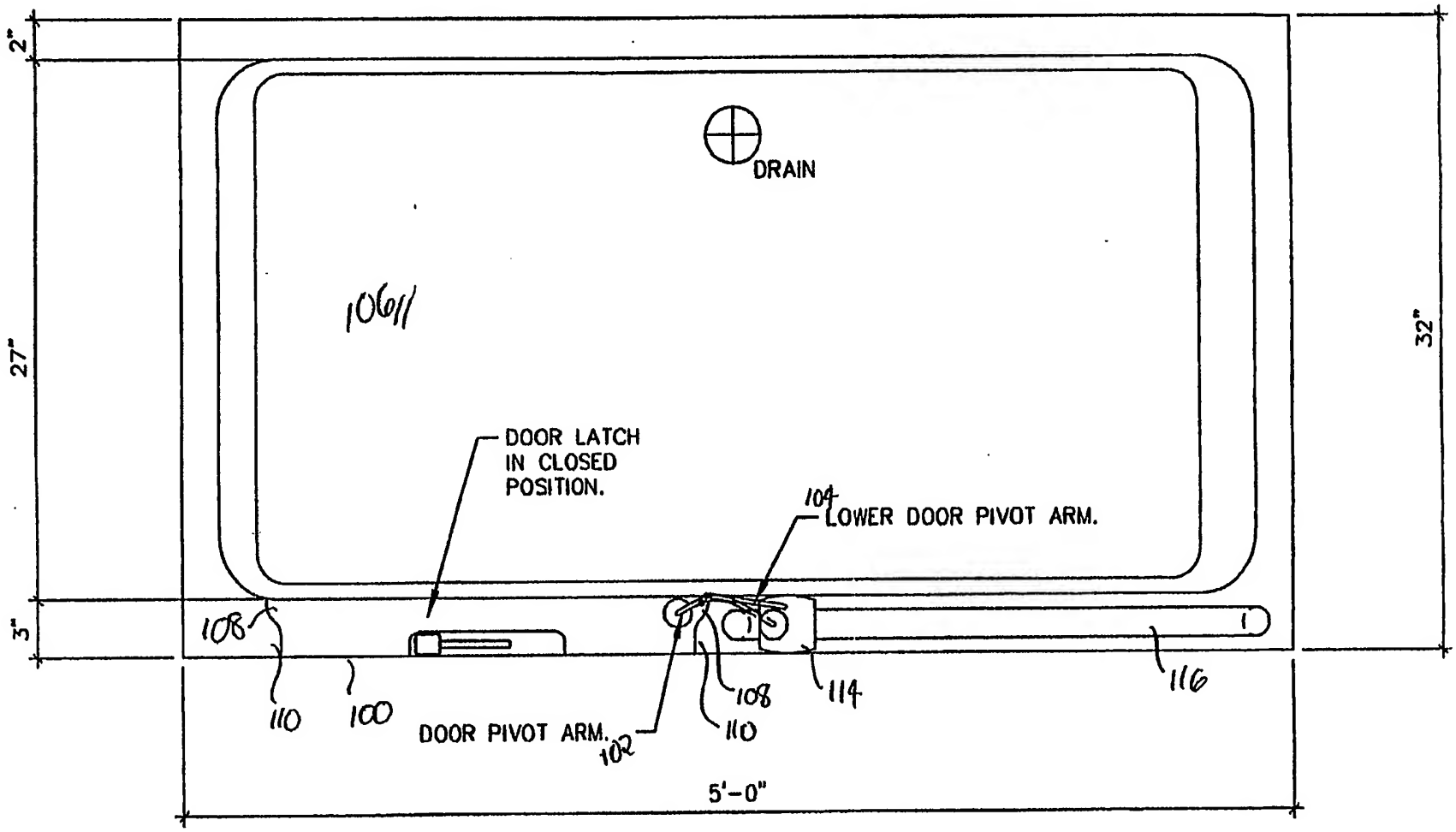
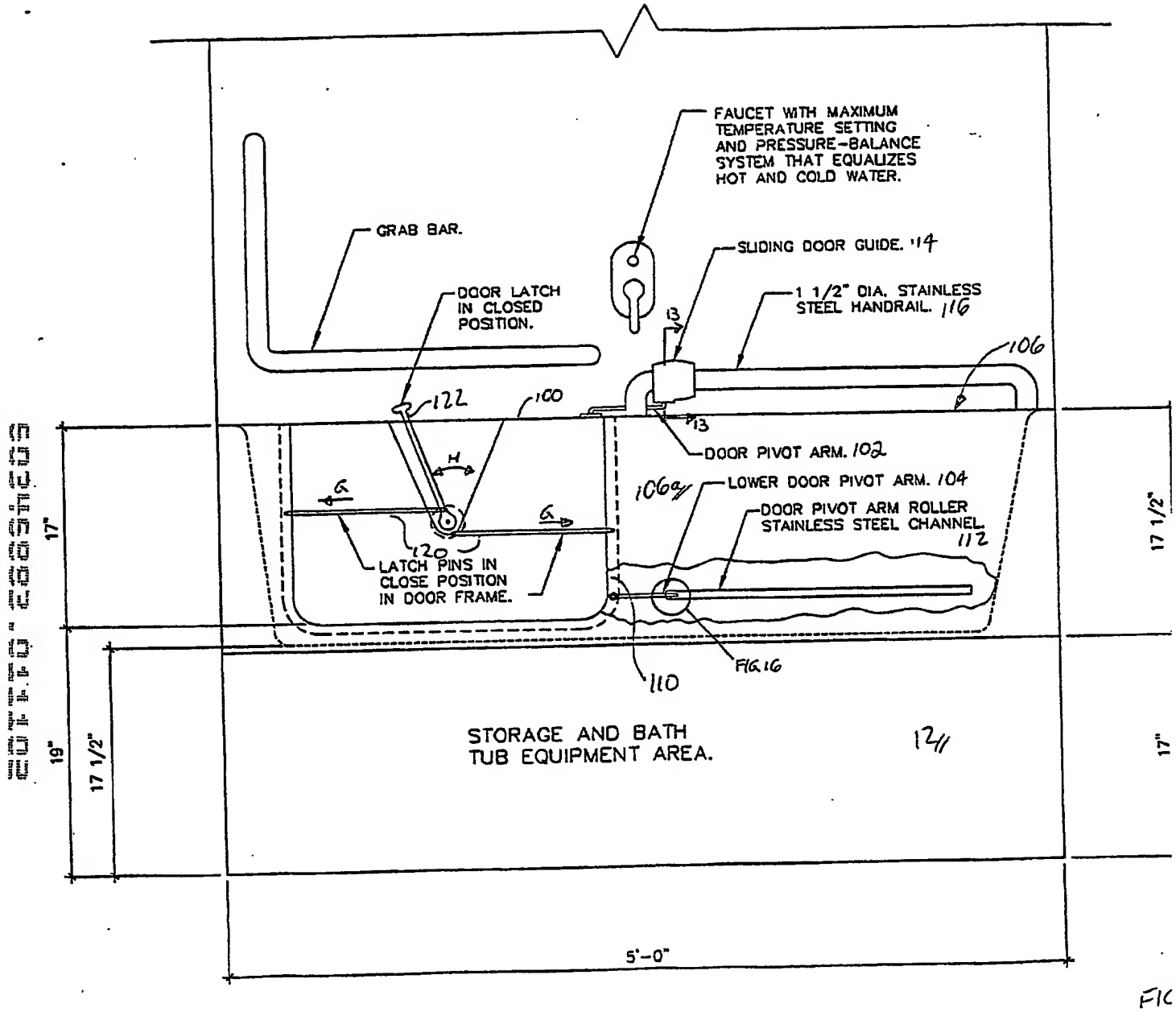


FIG 9

PLAN VIEW



FIG

SIDE VIEW

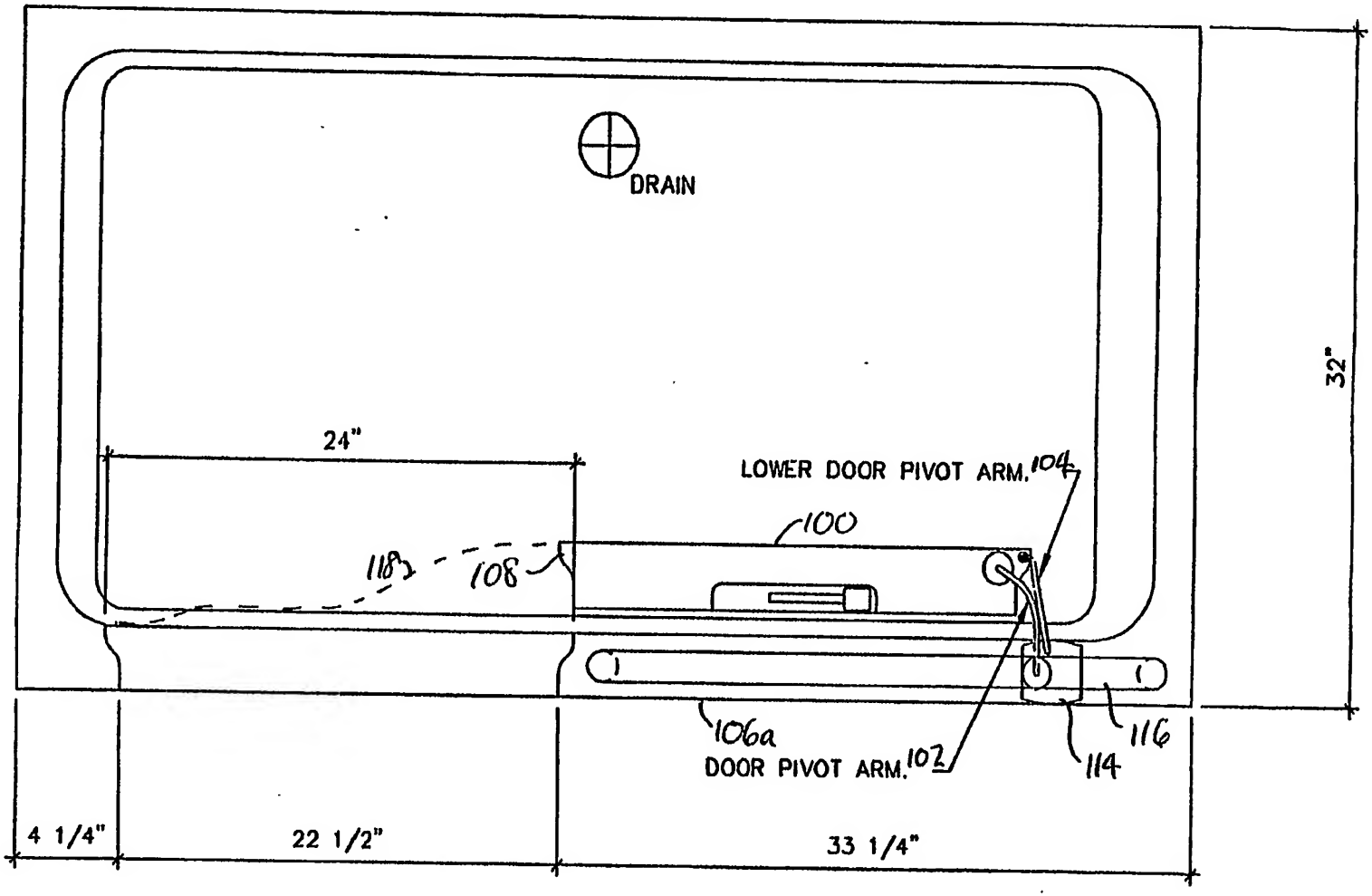


FIG. 11

PLAN VIEW

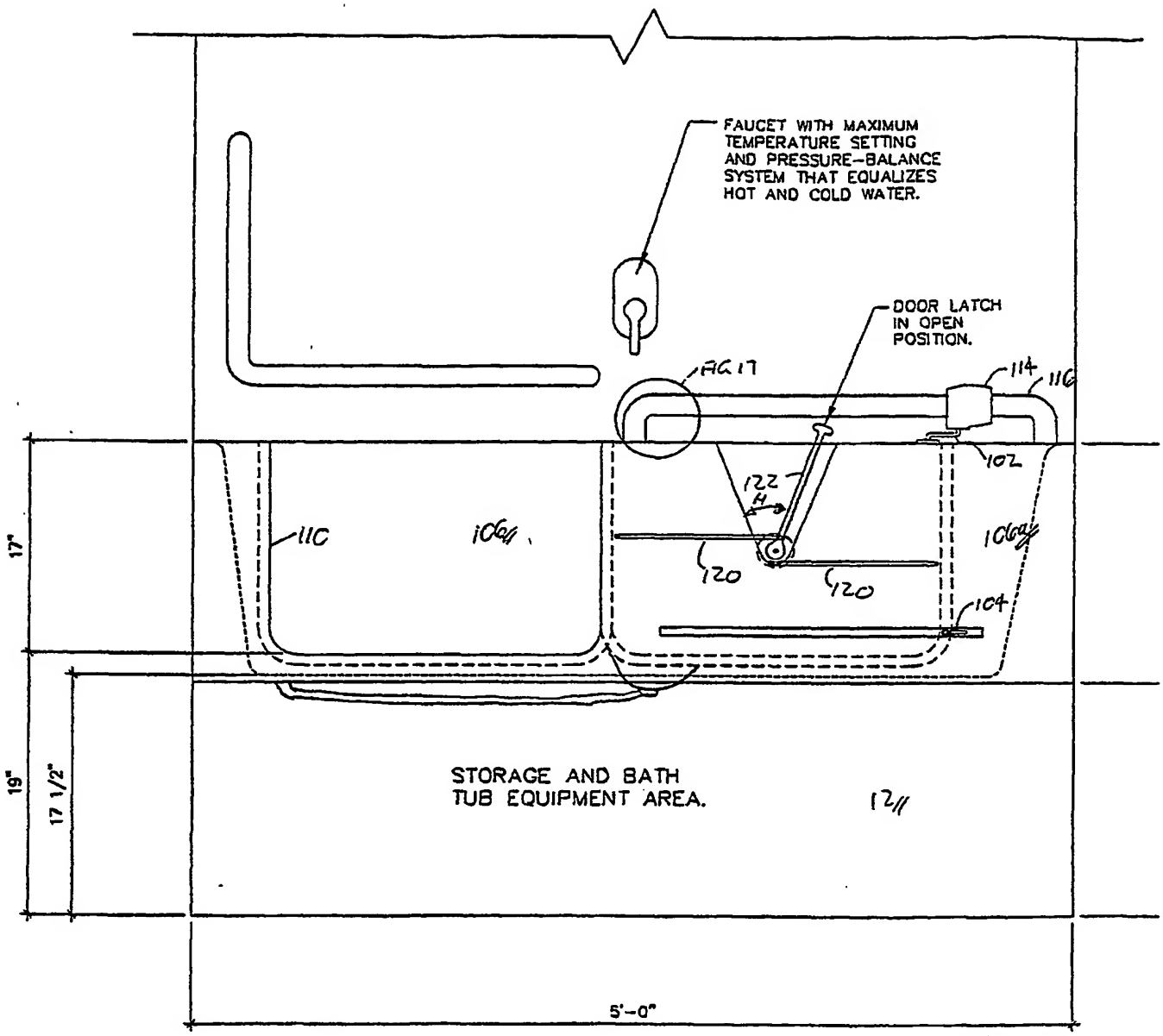
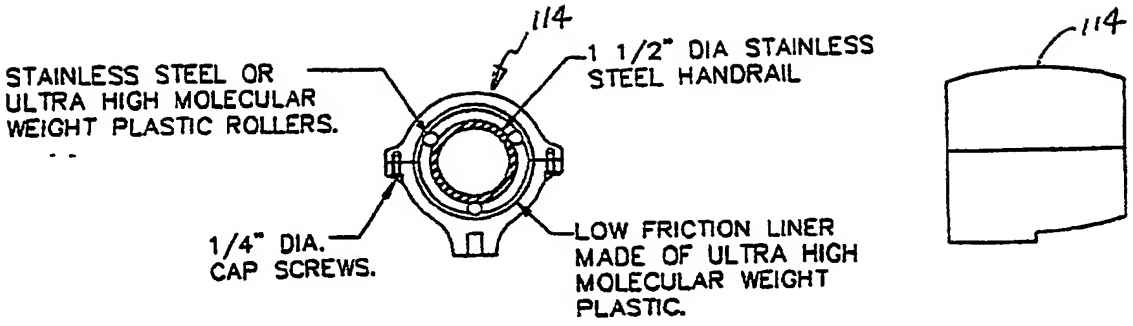
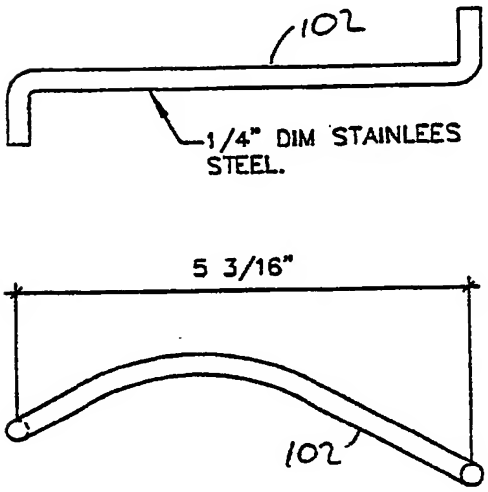

FAUCET WITH MAXIMUM TEMPERATURE SETTING AND PRESSURE-BALANCE SYSTEM THAT EQUALIZES HOT AND COLD WATER.
DOOR LATCH IN OPEN POSITION.
FIG 17
114
116
102
122
H
110
106
120
120
104
17"
19"
17 1/2"
STORAGE AND BATH TUB EQUIPMENT AREA.
112
5'-0"

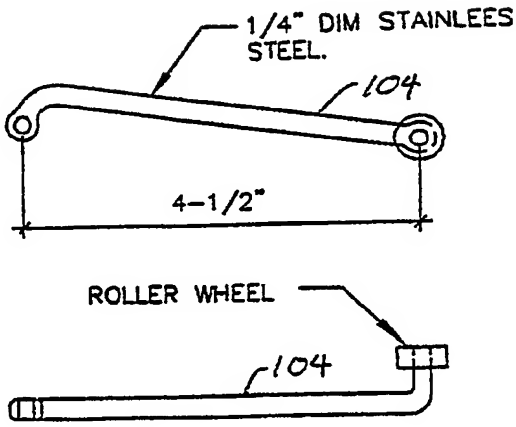
FIG 12



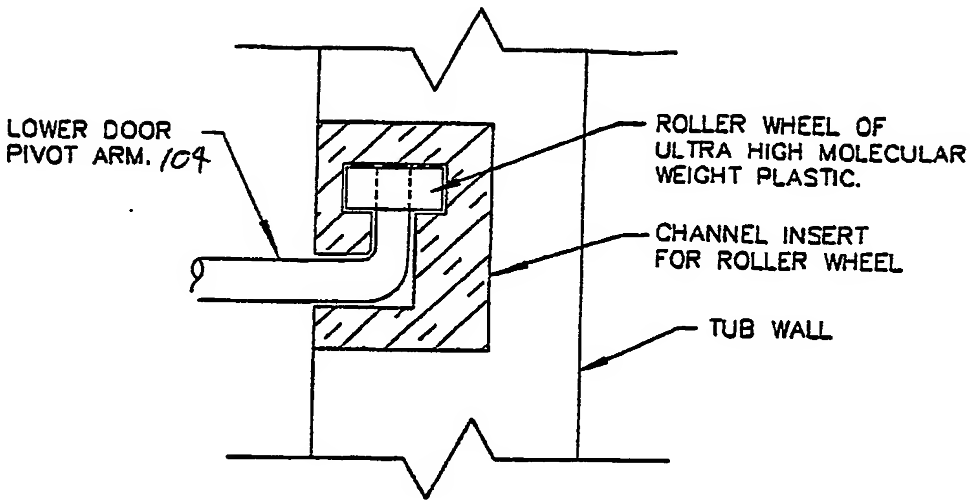
SLIDING DOOR GUIDE DETAIL FIG 13



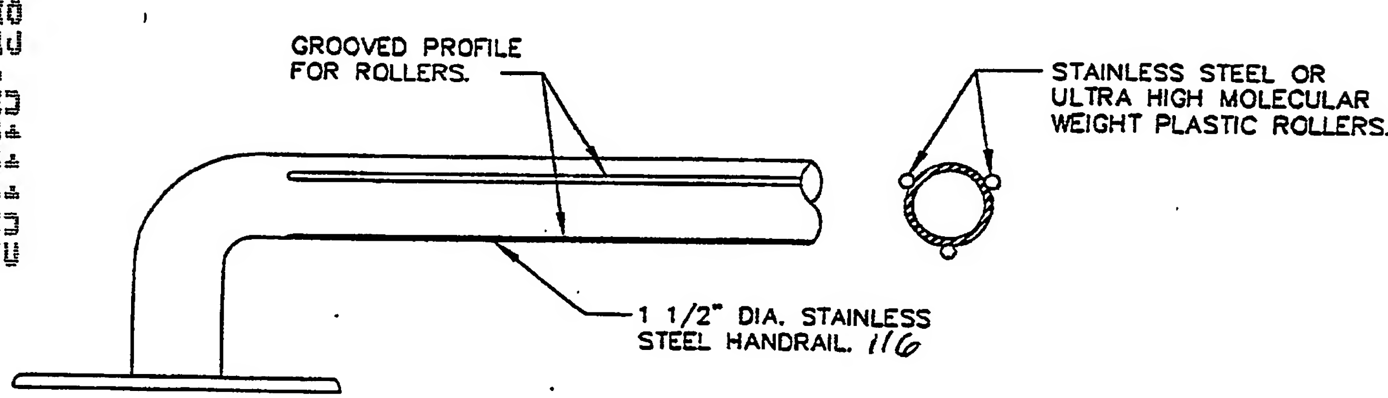
UPPER DOOR PIVOT ARM FIG 14



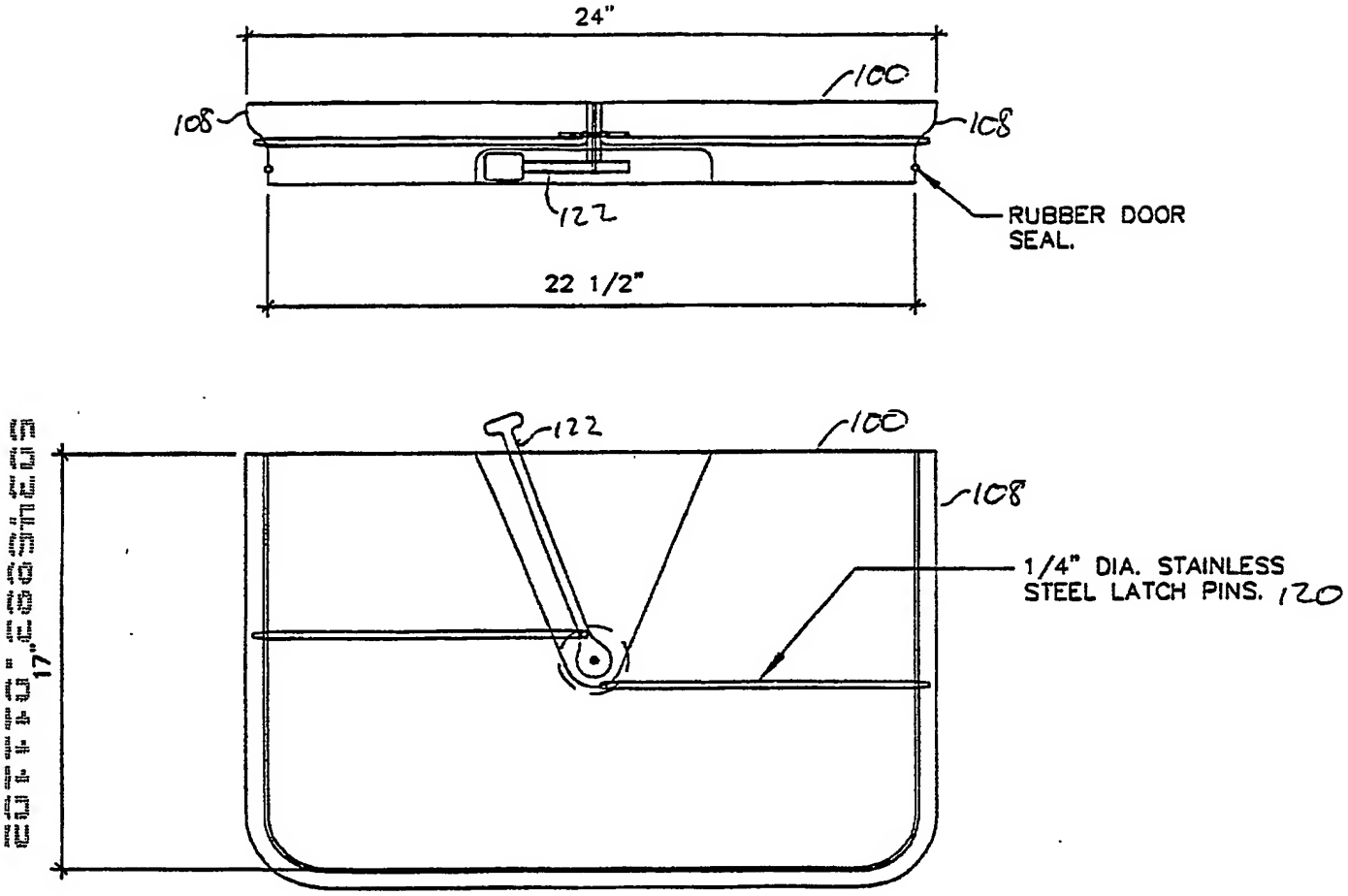
LOWER DOOR PIVOT ARM FIG 15



ROLLER WHEEL CHANNEL DETAIL FIG. 16



HANDRAIL/GUIDERAIL GROOVED PROFILE FIG. 17



SLIDING TUB DOOR FIG 18